

THERMOMETRIC OBSERVATIONS

ON

PNEUMONIA.



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ON

PNEUMONIA.^a

PERHAPS there is no local disease, the febrile symptoms of which so closely resemble those of the specific fevers as pneumonia. Indeed the invasion of this disease resembles so much that of typhus, that it is frequently mistaken for it in its earlier stages, and many cases are sent to fever hospitals as cases of specific fevers. Thus, in the year 1866 the total number of cases admitted into the London Fever Hospital (Liverpool-road) was 3,577; of these 590 were cases which had been sent to the hospital by mistake for specific fever; out of these 120, or about exactly one-fifth, were cases of pneumonia.^b

Again, in Glasgow, in the year 1865-66, there were admitted

^a This paper was read before the Medical Association of the King and Queen's College of Physicians, on February 15th, 1869, and is now published, with a few notes and a fuller detail of the cases than could be given in a paper read before a society.

^b Sixty-fifth Report of the London Fever Hospital for the year ending December 31, 1866.

into the City of Glasgow Fever Hospital 1,318 cases, 64 of which were not specific fevers, and of these 64 cases 27 were pneumonia. Out of 547 cases in 1866-67, 37 were not specific fever, and of these 15 were pneumonia. In 1867-68, out of 969 cases admitted 45 were not specific fevers, and of these 15 also were pneumonia.*

We thus see that in the two largest cities in the kingdom a large number of pneumonia cases are annually mistaken for fever (usually typhus) and sent into hospital. I have not had time to examine the statistics of the Dublin Fever Hospitals; but of Cork-street I can state that the number of pneumonia cases sent in there in mistake for typhus is considerable. What is the cause of these mistakes, and why is it that a large number of cases of inflammation of the lungs are annually subjected by mistake to the risk of taking fever in our fever hospitals? The answer is simply this:—A medical man accustomed to attend the poor in their own houses, is called to a patient, finds them with quick pulse, high temperature, furred tongue, and all the symptoms of commencing typhus; probably the patient says he has been longer ill than he has, and does not mention anything particular about his chest, and the medical man, consulting the interest of the patient, at once (on seeing such intense febrile symptoms) sends him to a fever hospital in order that no time may be lost in placing such a severe case in the most favourable condition for recovery. The error here is owing to the close resemblance between the febrile symptoms of pneumonia and those of typhus. This close resemblance makes the symptoms of these cases specially worthy of investigation. The chief and essential condition of fever is increased temperature; therefore when inquiring into the course a fever follows, and the variations it passes through, it is really the variation of temperature which most concerns us. The high temperature of the skin in pneumonia patients is a matter of everyday observation, but accurate thermometric observations upon them have not been plentifully recorded. Dr. Addison remarks on this high temperature, and says:—"But of all the symptoms of pneumonia, the most constant and conclusive, in a diagnostic point of view, is a pungent heat of surface; by this symptom alone the first stage of pneumonia may, in most instances, be easily recognized, and by this symptom alone

* Reports of the City of Glasgow Fever Hospital for 1865-66, 1866-67, 1867-68. By Dr. James B. Russell.

I have repeatedly pronounced the existence of pneumonia, before asking a single question or making the slightest stethoscopic examination of the chest. The presence of this symptom has scarcely ever yet deceived me in the most complicated forms of inflammation within the chest." Dr. Addison also remarks:—"Notwithstanding its close resemblance to an attack of continued fever—a resemblance so great that even the stethoscopist is thrown off his guard—attentive observations will, in most cases, enable us to recognize the difference."^a

Dr. Walsh quotes Addison, and also refers to the high temperature in this disease, and states that he has himself observed a temperature of 106° .^b

Since the clinical use of the thermometer has become more general than it was in the days of Addison, less attention has been paid to the thermometry of pneumonia, than of other acute diseases; nevertheless numerous and very accurate observations have been taken in this disease by the late Dr. Warter and by Dr. Compton. To these and to the observations of others, I now propose to add my own experience, believing that true results can be arrived at only by comparing the aggregate results of numerous observers.^c

First, let us consider the observations of others; Dr. Warter says:—"The temperatures seem to me to rise to a considerable height at once, for in the only case in which I tried it on the 1st day, the thermometer rose to $102^{\circ}8$, rising gradually seems to attain its greatest elevation on the 4th, 5th, and 6th days . . . the 4th being the most common. On this date, temperatures of 104° and 105° are to be met with and . . . after this the temperature falls pretty rapidly *together with* the pulse . . . Should the declining temperature of a case of pneumonia take a fresh rise, some new strip of pleurisy or pneumonia may be stated almost positively to exist. Contrary to what we might expect, double pneumonia does not seem to cause more febrile disturbance, as far as the curve of temperature is concerned,

^a A collection of the published works of the late Thomas Addison, M.D., &c. By Dr. Wilks and Dr. Daldy. New Sydenham Society. 1868. Pp. 13. Observations on Pneumonia read before the Guy's Physical Society, 1857.

^b A Practical Treatise on the Diseases of the Lungs, &c. By Walter Hayle Walshe, M.D., &c. Pp. 369 Third edition. 1860.

^c Professor See, in a paper, the second part of which has been published since this paper was read, notices the close resemblance between the thermometric ranges in this disease and variola:—"Du diagnostic des fièvres par la température." Par la Professeur See (2^e article), Bulletin Général de Thérapeutique, March 15th, 1869.

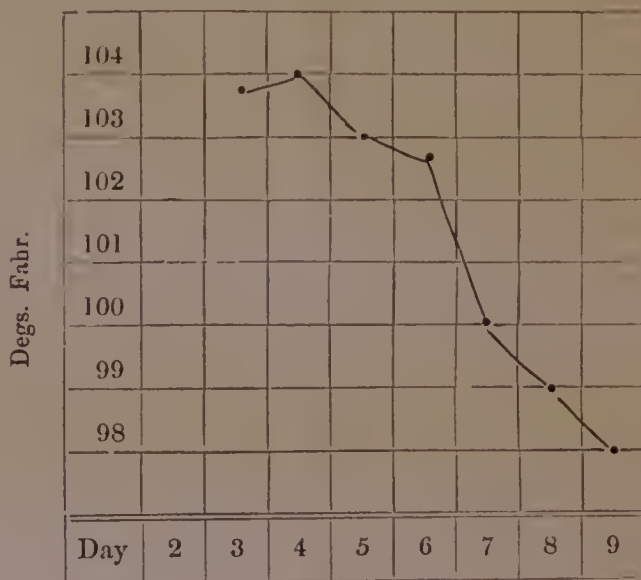
than by inflammation of one lung. The most fatal cases of pneumonia are certainly not those where the temperature ranges highest

. . I have taken normal temperatures where there has been bronchial breathing and mixed crepitation from top to bottom in one lung, and when the other was partially involved. Dr. Warter gives the following:—

Day.	Temperature.
3	103°·75
4	104°
5	103°
6	102°·8
7	100°
8	99°
9	98°

Diagram I.

WARTER'S RANGE.



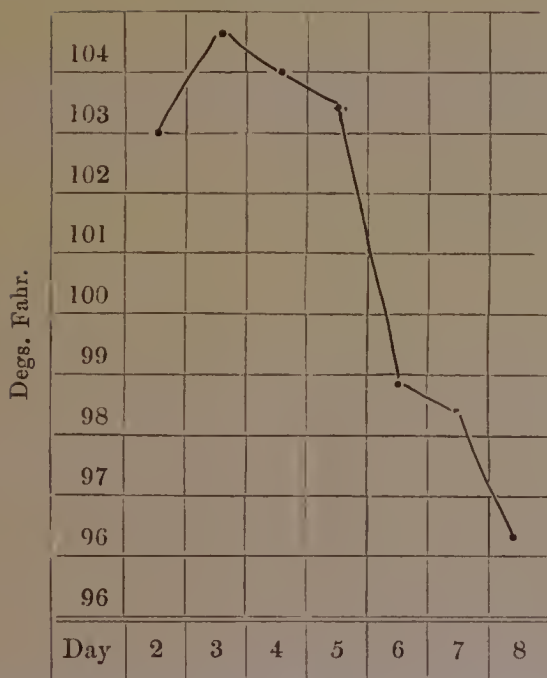
(See diagram, No. 1) as a typical range of temperature in pneumonia.^a

Dr. Compton does not refer particularly to pneumonia, but gives the following range of temperature for that disease, taken from a female, aged sixteen (See diagram, No. 2):—

^a Remarks on the Use of the Thermometer in Disease, by J. Southey Warter, St. Bartholomew Hospital Reports, p. 64, Vol. ii., 1866.

Day.	Temperature.
2	103°
3	104°·75
4	104°
5	104°·5
6	98°·8
7	98°·5
8	96°

Diagram II.
COMPTON'S RANGE.



The highest point, it will be observed, is 104°·75.^a

The following range of temperature is given by Dr. Parkes^b (See diagram, No. 3):—

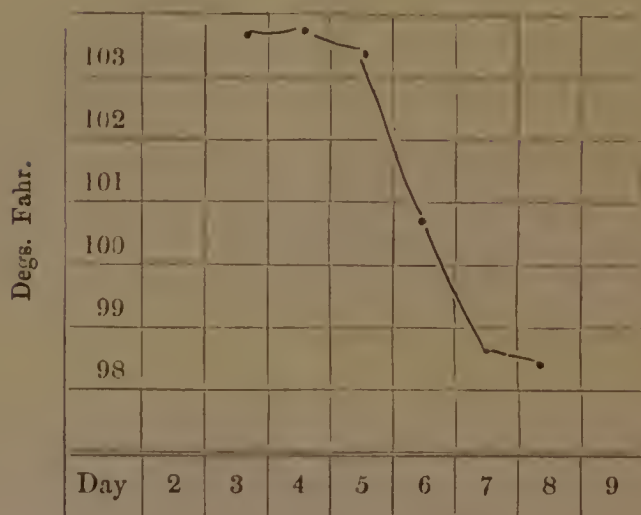
Day.	Respiration.	Pulse.	Temperature.
3	36	108	103°·6
4	36	107	103°·9
5	43	106	103°·4
6	38	93	100°·6
7	30	86	98°·6
8	31	76	98°·5

^a Temperature in Acute Disease by T. A. Compton, A.B., M.B., &c., Dublin Quarterly Journal of Medicine, Vol. xlii., p. 60.

^b Clinical Lectures delivered at University College Hospital. Observations on the Temperature of the Body, and on the Urinary Section, by E. A. Parkes, M.D., &c., Medical Times and Gazette, February 25th, 1860, p. 184.

Diagram III.

PARKES'S RANGE.



where no treatment was employed but a few leeches. I only give the mean temperature for each day, from which it will be seen that the highest mean was reached on the fourth day.*

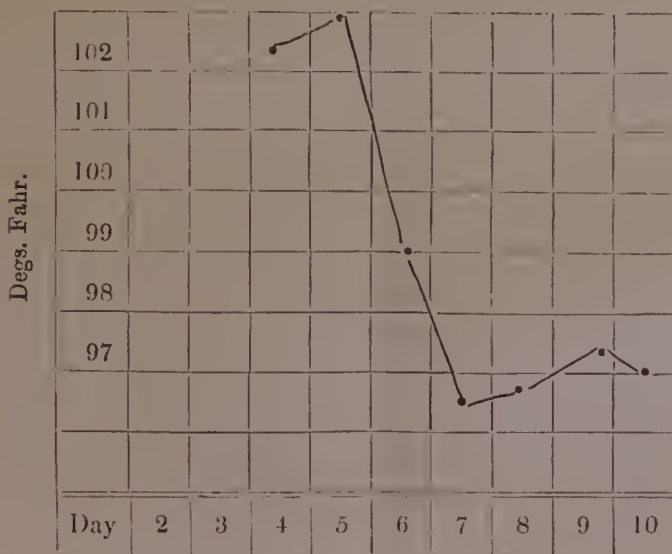
I have now to add the experience of another observer, before I detail the results of my own observations. Since the greater portion of the materials for this paper were arranged and the most of it committed to writing, an important paper by Dr. Maciagan of Dundee, on the thermometric range in pneumonia has been published in the current number (February, 1869) of the *Edinburgh Medical Journal*. This article escaped my notice until a week ago, and owing to its vague title, "Thermometrical Observations," I did not, when I first noticed it, examine it as carefully as I should have done, if I had known that it referred especially to the disease under consideration. The conclusions of Dr. Maciagan do not altogether (though pretty closely) accord with those arrived at either by the previously mentioned observers or by myself. Dr. Maciagan's observations should have an interest which none others have, except the case recorded by Dr. Parkes already noticed,

* At the time this paper was read before the Medical Association, the author was under a misapprehension with regard to the range given by Dr. Parkes, which led him into some errors in comparing it with the results of his own observations; therefore those who heard the paper read and may chance to meet it again in this form, may find some apparent discrepencies between the two statements, which I think it necessary thus to explain.

namely, that there were "sixteen cases of uncomplicated pneumonia (one or two of which have been detailed in his paper) which it was believed might safely be left to take their natural course." I am not sure, however, what Dr. MacLagan considers being left to take their "natural course" means, as he mentions one case as allowed to run a natural course without the application of "remedial agents," which nevertheless (although a girl of only fourteen years of age), was allowed 4 ounces of wine daily! In Dublin, however, we should consider it an important element of treatment. Dr. MacLagan also considers light diet (perhaps including *wine*), poultices, and in one case, blisters over the affected side, *no* treatment! I cannot agree with him in this, nor am I of the opinion that we can afford to stand by, and watch any case of pneumonia taking its natural course, even for the sake of science, I give a range of temperature taken by Dr. MacLagan in a case which apparently did not get any wine but was *only* blistered, as a fair average case of pneumonia. (See diagram, No. 4.)

Day.	Respiration.	Pulse.	Temperature.
4	56	120	102°·3
5	56	120	103°
6	38	96	99°·1
7	32	72	96°·4
8	32	68	96°·8
9	28	72	97°·1
10	36	72	97°·1

Diagram IV.
MACLAGAN'S RANGE.



I shall now proceed to detail the results which I have arrived at from my own observations, the majority of which I have taken myself upon patients under my own care and that of my friends and colleagues, Drs. Kennedy, Mason, and Burke; but I am indebted for many to my industrious and zealous pupils, Dr. Skelton and Mr. Clements, of Cork-street Hospital, and to Mr. Rathborne, of Steevens' Hospital, whose observations are equally reliable with my own. In all cases where evening temperatures (which, however, I do not refer to in this paper) have been taken, they have been recorded by my pupils. My observations have extended over about 40 cases, selected during the past three years from those admitted into Cork-street and Steevens' Hospitals. As there are many sources of fallacy in inquiries such as these, I have excluded a considerable number of cases for various reasons, but especially as the exact date of the commencement of illness was doubtful. I find that the length of the illness of pneumonia patients is usually overrated by them, being generally dated from some trivial cold, arising a week, fortnight, or three weeks before the case comes under the care of the physician. I generally find that two or three days usually elapse from the commencement of the acute disease (or, as hospital patients say, from the time they were "real sick") until they apply for medical advice. My results, which I have obtained by daily observations, have been confirmed from time to time by casual observations on cases, of which I had not the opportunity of making continuous daily records.

In drawing conclusions, I have only taken into consideration *one* observation daily, for reasons I have elsewhere stated,^a namely, that practically we can usually obtain but one record of temperature each day.^b

^a Thermometric Observations in Fever, Medical Press and Circular, pp. 73, 121, 169. Vol. i. 1866.

^b Wunderlich, in his recent work on the Thermometry of Disease ("Das Verhalten der Eigenwärme in Krankheiten," Leipzig, 1868), rather severely reprimands me for pursuing this course; nevertheless, I have not altered my opinion that for practical purposes we must rely on one daily observation.

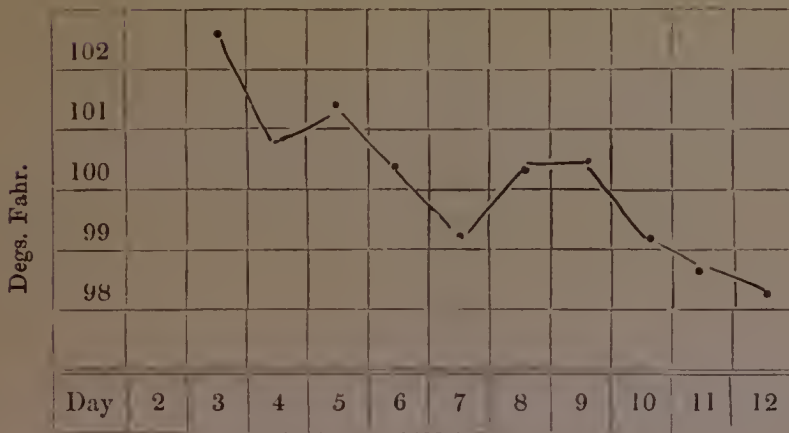
Wunderlich also seems to think that because I have noted many whole degrees, some doubt is thrown on the accuracy of my observations. He seems, however, to have overlooked the fact that a degree of his scale (Centigrade) is about double ($1^{\circ}8$) a degree on our scale, and that therefore the chances of noting whole degrees is much greater in my observations than in his. In my observations on typhus which Wunderlich criticises, I noted degrees, halves, and quarters, which would correspond nearly with halves, quarters, and eighths of the Centigrade scale, and are therefore nearly as minute divisions as his own. I am glad, nevertheless, to find that on the whole my observations agree very closely with those of the great German clinical thermometrician.

With a view of obtaining a *mean* range of temperature, I have made a calculation from about 20 cases. (See diagram, No. 5.)

Day.	Temperature.
3	102°·75
4	100°·8
5	101°·38
6	100°·34
7	99°·12
8	100°·11
9	100°·32
10	99°·31
11	98°·77
12	98°·42

Diagram V.

AVERAGE RANGES CALCULATED FROM 20 CASES.



Such a range will, of course, seldom if ever be met with in any *one* case, but it shows what may turn up, generally as to its highest and lowest temperature, and occasionally as to its variations, namely, the highest temperature is usually met with on the 2nd, 3rd, or 4th, to 5th days, and the lowest after the 6th. We also observe irregularities; for instance, a rise on the 5th, and on the 8th and 9th days; I do not attach much importance to such an average for pneumonia, but give it merely as it is usual in other observations of the kind. The following may be considered as an average case, selected from a considerable number (about 40) complicated and uncomplicated:—

CASE I.—*Fair example of average Pneumonia running ordinary favourable course.* (Under care of Dr. Kennedy.)

Edward F——, aged twenty-one years; three days before his admission into Cork-street Hospital, on July 5th, 1867 (4th day). All symptoms of pneumonia, in base of right lung, well marked with considerable bronchitis; respiration, 46; pulse, 100; temperature, $103^{\circ}5$.

5th day.—Much same state; respiration, 48; pulse, 108; temperature, 102.

6th.—Sharp pain at base of right chest, probably pleuritis; respiration, 40; pulse, 110; temperature, 103.

7th.—Much same state, but pleuritis less; respiration, 48; pulse, 108; temperature, 103° .

8th.—Better in every way; expectoration less and not rusty; respiration, 48; pulse, 84; temperature, 97° .

9th.—Better; respiration, 36; pulse, 84; temperature, $97^{\circ}5$.

10th.—Light hemoptysis; respiration not noted; pulse, 84; temperature, 98.

11th.—The respiration gradually becoming natural; pulse, 84; respiration, 30; temperature, 98° .

12th.—Improving; respiration, 30; pulse, 84; temperature, 98° .

13th.—Respiration, 26; pulse, 72; temperature, $97^{\circ}5$.

14th.—Respiration, 20; pulse, 80; temperature, 97° .

15th.—Convalescent; pulse, 90; respiration natural; temperature, 98° . (See diagram, No. 6.)

Diagram VI.
RANGE OF AVERAGE CASE.



As cases for observation before the 4th day are very few, and in some of these the duration doubtful, I cannot say much about them; but, as far as my experience has gone, I believe the highest temperature is reached on the 3rd or 4th day. In the specimen case which I have here recorded the highest temperature was taken on the 4th day— $103^{\circ}\cdot5$; a fall takes place on the 5th, but this was unusual (and in this case I could see no explanation of it), and may not be taken into account. On the 6th it is 103° ; on the 7th the same; then falls to 97° (below the average normal temperature), from which time it continues within the limits of health; and this I consider the usual course of the thermometric range. I give another here as an example of a usual case of pneumonia.

CASE II.—*Case of ordinary severe Pneumonia following regular course.* (Under care of Dr. Kennedy.)

John F——, aged forty years; admitted into Cork-street Hospital on January 9th, 1866, on the 5th day of his illness. Pneumonia of base of right lung; all symptoms well marked.

In this case the rusty sputum continued until the 8th day. The patient was nearly well on the 14th day, and left the hospital of his own will against advice.

The following is the range of pulse, respiration, and temperature for this case:—

Day.	Respiration.	Pulse.	Temperature.
5	42	108	$103^{\circ}\cdot25$
6	36	96	$99^{\circ}\cdot75$
7	28	84	99°
8	24	72	$97^{\circ}\cdot5$
9	24	72	97°
10	18	72	98°
11	24	84	97°
12	20	80	$96^{\circ}\cdot75$
13	20	80	$97^{\circ}\cdot75$
14	Discharged.		

Comparing this typical case with those of Drs. Warter, Compton, Parkes, and MacLagan:—

COMPARATIVE TABLE OF RANGES OF TEMPERATURE IN PNEUMONIA.^a

Day	Grimshaw	Warter	Compton	Parkes	MacLagan
2	—	—	103	—	—
3	—	103·75	104·75 *	103·6	—
4	103·5 *	104 *	104	103·9 *	102·3
5	102	103	104·5	103·4	103 *
6	103	102·8	98·8 †	100·6	99·1
7	103	100	98·5	98·6 †	96·4 †
8	97 †	99	96	98·5	96·8
9	97·5	98 †	—	—	97·1
10	98	—	—	—	97
11	98	—	—	—	—
12	98	—	—	—	—

Maximum day marked thus *. Day of decided fall †.

* Since the above was written, I have had the opportunity of studying the ranges of temperature given for this disease by Wunderlich and See, in the works already quoted (see notes, p. 337 and 342); from these the following mean daily ranges have been calculated and reduced to Fahrenheit scale.

Day.	Wunderlich	See
2	105·9*	104·3
3	104	105·2
4	104·2	105·5*
5	102·6	105·4
6	101·7	105·6
7	†	100·3
8		97·3†

* Maximum.

† Day of decided fall.

From the above table it is apparent that, according to Wunderlich, in ordinary (for

I find that the maximum is attained on the same day as Dr. Warter's, does not rise so high as his; that the high temperature is continued for about the same time (only a day less), the fall more gradual, and the normal temperature attained about the same time. Comparing with Dr. Compton, I find that the highest temperature in the range of his typical case is reached on the third day, which generally agrees with any observations I have been able to obtain for that day. The high temperature does not continue so long (to the fifth day) in his as in mine, and the normal reached sooner (on the sixth day) than mine. Comparing with Dr. Parkes, I find the highest temperature is reached on the fourth day (same as mine), maintained until the sixth day (a day earlier than mine), when it is 100·6, and the normal attained on the 7th and 8th, a day earlier in mine.

Comparing with Dr. Maelagan's case, selected by myself, the maximum is attained a day later (the 5th), the fall (on the 6th day) is earlier by two days, and the normal is gained on the 9th, a day earlier than mine.

Taking sixteen cases of my own, in which there is scarcely a doubt about the exact date of the commencement of the disease, the highest temperature was reached as follows:—

On the 3rd day in	-	-	3 cases.
„ 4th „	-	-	3 „
„ 5th „	-	-	2 „
„ 6th „	-	-	0 „
„ 7th „	-	-	1 „
„ 8th „	-	-	2 „
„ 9th „	-	-	1 „
„ 10th to 16th	-	-	4 „

Thus in 8 cases, the highest temperature was reached on the 3rd, 4th, and 5th days; in 4 cases, on the 6th, 7th, 8th, and 9th; and in 4, from the 10th to the 16th days; in other words, in half these cases, the maximum was reached on the 3rd, 4th, or 5th days, and

he notices various species which would not be admitted by most British physicians) pneumonia, the maximum is attained on the 2nd day. My observations are too few for that day, either to confirm or deny this statement. He gives a second (if the term is allowable) maximum for the 4th day, which corresponds with my observations; the normal is reached on the 7th—a day earlier than in mine.

The range given by See differs very much from that of all other observers, maintaining a very high temperature with but slight variations from the 2nd to the 6th day inclusive. The normal is attained on the same day as in mine.

in this I agree with other observers, for Dr. Warter gives the 4th, Dr. Compton the 3rd, and Dr. Maclagan the 5th day, and Dr. Parkes the 4th day. From similar data I have come to the conclusion that a high temperature is maintained for from 2 to 4 days, the period varying according to the severity of the case and according to the complications that arise. Although I say a high temperature is maintained, I do not mean that it is constantly at the maximum, but is above 100° , for I believe it usually begins to fall immediately after reaching its maximum, unless some new complication arises, or is about to arise. Thus in a severe case,^a uncomplicated, except by an attack of bronchitis after the crisis of the pneumonia had passed, in a female aged eighteen years, under the care of Dr. Kennedy, now convalescent, the temperature obtained on the 4th day was $104^{\circ}25$ on the affected side, and 103° on the healthy side, which latter may be considered the real temperature of the body. The high temperature was maintained until the evening of the 5th day, and fell below the normal on the 6th day. In this case the lowest temperature (95°) which I have noted, occurred. In another case,^b a male aged twenty-

^a CASE III.—*Case of very severe Pneumonia, with very Extensive and Sudden Fall. Comparison of Temperature on Healthy and Affected Sides.*

Bridget B., servant, eighteen years of age. Three days ill before admission into Cork-street Hospital, on February 11th, 1869. All symptoms of pneumonia well marked on right side. Abundant rusty sputum.

4th Day—Same state. Respiration 52; pulso 132. Temperature on right (affected side), $104^{\circ}25$; left side, 103° .

5th—Worse; but says she is better. Respiration 60; pulse 100. Temperature, right side, 102° ; left, $100^{\circ}5$.

6th—Was much worse during night, but now (11 a.m.) much better than at the same time yesterday. Respiration 32; pulso 84. Temperature, left side, 95° .

7th—Not so well; was worse yesterday evening; some bronchitis in left lung. Respiration 36; pulse 96° . Temperature $101^{\circ}2$.

8th—Hemorrhage from nose; sputum not coloured; sweating. Respiration 29; pulse 100; temperature 98° .

11th—Convalescent, but complains of occasional pains in sides. This case was treated by chlorate of potash, wine, and whiskey, and extensive blisters and poultices on the affected side.

^b CASE IV.—*Case of Pneumonia complicated with Pleuritis and Scarlatina.* Under the care of Dr. Burke and the Author, in Dr. Steevens' Hospital.

Henry B.—, aged twenty-eight years; groom; had a cold a week ago, but dates the present attack from two days before his admission into Steevens' Hospital on January 20th, 1869; had two previous attacks of inflammation of the lungs. On admission all the symptoms of pneumonia well marked, together with some of pleuritis; inflammation confined to left side of chest.

eight, who came under my care in Steeven's Hospital (when recently acting for my friend Dr. Burke), there was considerable pleuritis with the pneumonia; the patient was also attacked with scarlatina, during the progress of the pneumonia. The temperature on admission to hospital (3rd day) was $103^{\circ}5$; it fell on the 5th day, but rose again on the 6th to 184° , rather to my astonishment as all the other signs and symptoms had improved. On the 9th day the scarlatina eruptions appeared, so the rise on the 6th day may have been and probably was due to the accession of the scarlatina. The temperature in this case was maintained until the 19th day (when it was still $100^{\circ}4$); on the 20th day it fell to 98, and a few days afterwards the patient was allowed to get up. In this case the highest temperature I ever recorded in pneumonia ($104^{\circ}6$) was noted, but not during the scarlatina attack. These cases are fair examples of severe cases of pneumonia, one complicated, the others uncomplicated. In three cases I have observed a difference in temperature on the healthy and affected sides; of one of these unfortunately I have no notes, and my observations were not continuous; in another the difference was only 0.75 of a degree; in another of the girl just referred to (see note, case 3), there was on one occasion a difference of $1^{\circ}25$; in others $1^{\circ}5$ and 1° difference;

January 21, 3rd day.—Pulse very weak, 120; respiration, 48; temperature, $103^{\circ}5$.

4th day.—Pulse weaker, 120; respiration difficult, 55; temperature, $102^{\circ}8$; right lung affected at base.

5th.—Distinct friction sound posteriorly on left side; great dyspnea; countenance anxious; respiration, 48; pulse, 108; temperature, 100. In the evening the patient was much worse, and some pleuritic stitches occurred on the left side.

6th.—Better; respiration much easier, 40 per minute; pulse, 125; temperature, 104° ; rusty sputum nearly gone.

7th.—Much better; respiration much more healthy; rusty sputum ceased; bronchitic sputum; diarrhea; respiration, 34; pulse, 120; temperature, $103^{\circ}2$.

8th.—Delirious and restless during night; pain in head; tongue dry and brown; pulse very weak; symptoms typhoid; respiration, 40; pulse, 130; temperature, 103; scarlatina eruption well marked on arms and legs; but slight sore throat.

9th.—Better; eruption fading; crepitus still distinct at back on both sides; respiration, 44; pulse, 104° ; temperature, $98^{\circ}4$.

Several relapses occurred, the temperature rising on four occasions to 104° , and above 104° .

February 7th.—Temperature fell to normal, but pulse still quiet.

On February 10th he was able to sit up. He gradually gained strength, and was discharged from hospital on February 26th, 1869.

The treatment consisted of nitrate of potash and quinine internally; wine in large quantity up to twenty ounces per day. Blisters, poultices, and turpentine stupes were applied externally. On one occasion leeches were applied to the temples to relieve headache.

in all cases where a difference existed, the diseased side had the highest temperature.^a

When pneumonia occurs *as* a complication of another disease it causes a temporary *increase* in the temperature; for instance, there was a boy affected with typhus,^b in whom an attack of pneumonia occurring on the 9th day was preceded by a rise of temperature to 104°·5, it having previously fallen to 103°. In a case of typhoid,^c

^a Since the above was written I have made observations on two more cases in which I found no difference between the healthy and diseased sides. In those cases where a higher temperature was observed on the diseased than on the healthy side, a large part (nearly the whole) of one lung was affected. As the thermometer was placed in the axilla, it is probable that the high temperature marked by the instrument was owing to the proximity of a large mass of inflamed tissue. On a future occasion I hope more closely to examine this question by taking the temperature in the groin or some other part distant from the local inflammation.

^b CASE V.—*Pneumonia occurring as a complication in Typhus Fever.* Under the care of the Author in Cork-street Hospital.

Patrick D—, aged fifteen years; one day ill before his admission on September 13th, 1867; father and sister have both had typhus.

2nd day.—September 14; seen first on this day; respiration, 26; pulse, 115; temperature, 103°; bronchitis.

4th.—Worse; respiration, 24; pulse, 108; temperature, 103°·5; bronchitis.

5th.—Mottled; respiration, 30; pulse, 90; temperature, 104°.

6th.—Spots more distinct; respiration, 24; pulse, 100; temperature, 103°.

7th.—Spots darker; respiration, 40; pulse, 120; temperature, 103°·5.

8th.—Worse; respiration, 28; pulse, 120; temperature, 103°·5.

9th.—Worse; respiration, 48; pulse, 125; temperature, 104°·25.

10th.—Spots fading; pneumonia base of right lung; bronchitis still continues; respiration, 36; pulse, 120; temperature, 103°·5.

11th.—Pneumonia sputum; worse; respiration, 34; pulse, 120; temperature, 102°.

12th.—Spots nearly gone; expectoration less; respiration, 30; pulse, 90; temperature, 100°.

13th.—Spots gone; chest much better; respiration, 36; pulse, 100; temperature, 102°·2.

14th.—Better in every way; respiration, 36; pulse, 90; temperature, 101°·5.

The patient was convalescent on the 17th day.

This case was treated by tea, some wine was given when the pneumonia appeared, and blisters were applied on the chest.

^c CASE VI.—*Pneumonia occurring as a Complication of Typhoid.* Under the care of Dr. Kennedy; observations recorded by Dr. Skelton.

Honor F—, nineteen years of age, attacked by typhoid after recovery from typhus.

February 23rd, 1868.—Did not seem very unwell, but attention was attracted by the quick pulse and high temperature. She quickly got worse during the next few days; respiration, 26; pulse, 110; temperature, 103°·5.

24th.—Tongue with moist, fur in centre; had diarrhea, but bowels now quieter; respiration, 32; pulse, 100; temperature, 104°; diarrhea, typhoid character; pain on pressure, and gurgling in right iliac region.

where the temperature had been up to $104^{\circ}\cdot8$, and gradually fallen to 102° , it again rose to $104^{\circ}\cdot6$ on the accession of pneumonia, afterwards falling to 102° , and again rising to $104^{\circ}\cdot8$ on an increase of the pneumonic symptoms. I do not find that in pneumonia of both lungs the temperature is higher than when only *one* lung is attacked, nor does the extent of tissue affected make much difference. As to the relation of temperature to other conditions, I find that the temperature attains its maximum during the period of expectoration of rusty coloured matter, but falls while this still continues; in other words, it attains its maximum and begins to fall during the second stage of the disease. Dr. MacLagan states that the fall does not occur until the third stage

25th.—Tongue bright red, slightly furred, turning brown; respiration, 48; pulse, ; temperature, 103° . All symptoms of typhoid well marked.

26th.—Small dry tongue, bright red at edges and tip; delirious at night; subsulties; respiration, 30; pulse, 106; temperature, $104^{\circ}\cdot8$.

27th.—Much same state; respiration, ; pulse not noted; temperature, 103° .

28th.—Same state; respiration, 38; pulse, 116; temperature, $103^{\circ}\cdot2$.

29th.—Diarrhea much worse; slight bronchitis; respiration, 44; pulse, 136; temperature, 102° .

March 1st.—Pneumonia commencing at base of left lung; respiration, 36; pulse, 126; temperature, $104^{\circ}\cdot6$.

2nd.—Cough very troublesome; rusty sputum; no diarrhea; face very pale; pulse 120, very weak; respiration, 42; temperature, 103° .

3rd.—Better night; diarrhea, bowels moved three times; respiration, 46; pulse, 122; temperature, 102° .

4th.—Not so well; respiration, 42; pulse, 132; temperature, $103^{\circ}\cdot8$.

5th.—Much same state; respiration, 36; pulse, 120; temperature, 103° .

6th.—Pneumonia worse; cough very troublesome; respiration, 42; pulse, 138; temperature, $104^{\circ}\cdot8$.

7th.—Decidedly better than yesterday; respiration, 48; pulse, 134; temperature, $101^{\circ}\cdot6$.

8th.—Improving; respiration and pulse not noted; temperature, 102° .

9th.—Better; no diarrhea; respiration, 42; pulse, 126; temperature, $102^{\circ}\cdot6$.

10th.—Respiration, 36; pulse, 96; temperature, 102° .

11th.—Respiration, 38; pulse, 132; temperature, 102° .

12th.—Respiration, 36; pulse, 132; temperature, $100^{\circ}\cdot2$.

13th.—Very weak still; occasional rusty sputum; sleeps badly; cough troublesome; stethoscopic signs of pneumonia still present.

14th.—Pneumonia less, but still some bronchitis; respiration, 36; pulse, 120; temperature, $99^{\circ}\cdot4$.

15th.—Better; respiration, 30; pulse, 90; temperature, 101° .

16th.—Respiration, 24; pulse, 108; temperature, 102° .

17th.—Respiration, 24; pulse, 108; temperature, 96° .

18th.—Much better; respiration, 30; pulse, 114; temperature, $98^{\circ}\cdot5$.

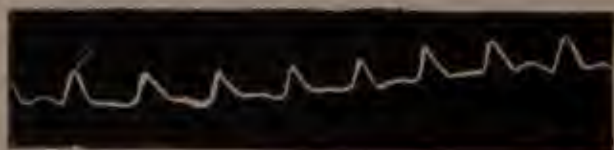
The patient continued to improve, and was convalescent on March 27th, 1869.

This case was treated by sulphuric acid and opium; wine in large quantities; blisters to chest and on right iliac region.

commences. It is well known, however, that *all* the stages of pneumonia are usually present during a considerable portion of the duration of each case. I therefore prefer to speak of the duration of the rusty sputum to speaking of any special stage as all stages may co-exist.

This observation has some relation to the question whether pneumonia is essentially a local disease or local manifestation of a specific fever. Certainly, the fall of the temperature before the lung mischief is on the decline—indeed we may say before it is complete—rather points to the disease being of the character of a specific fever. I am rather inclined to this opinion myself, but do not propose to pursue this question farther at present (interesting though it be). With reference to the relation of temperature to other symptoms—pulse and respiration particularly, I find that the pulse and temperature usually fall together, or the latter shortly before the former; thus, in 12 cases where the relation between the pulse symptoms is specially and exactly noted, in 6 the temperature and pulse fell together, in 5 the temperature fell shortly before the pulse, and in one only the pulse fell before the temperature. The fall in temperature does not generally, as in other diseases, precede the fall in the rate of the pulse. The high temperature corresponds also in most cases with a typhus pulse—*i.e.*, a pulse of very low tension, easily influenced by pressure. (See sphygmograms, Figs, 1 and 2.)

Fig. 1.



Male, aged 20 years; 6th day; temperature, 103° .

Fig. 2.



Male, aged 22 years; 6th day; temperature, $103^{\circ}\cdot6$.

The relation between the temperature and respiration is more

remarkable than its relation to the pulse. We usually find that the temperature diminishes before the respiration decreases in rapidity; thus, in the case already cited as having a typical range, the respiration continued above 36 per minute until the 9th day, although the temperature fell on the 8th day, and I could quote several such examples.^a

As a means of diagnosis the temperature may be useful in distinguishing this disease from typhus, for the maximum in this disease is always attained before the 6th day, usually on the 3rd or 4th; whereas in typhus the maximum is not usually attained until the 7th day or later; thus, if one finds a patient with febrile symptoms and a very high temperature (103° or more) on the 3rd or 4th day, we may suspect pneumonia, and almost certainly exclude typhus, which is the disease most liable to be confounded with it.^b The following conclusions are, I think, justified by the foregoing observations:—

1st.—Pneumonia has (when uncomplicated) a tolerably definite range of temperature.

2nd.—The highest temperature attained is usually between 103° and 104° Fahr.

3rd.—The maximum temperature is usually attained on the 3rd, 4th, or 5th day, after which the temperature falls and reaches the normal on the 6th or 7th day.

^a Mary C——, aged fifteen years.

On the 2nd day the temperature was 104°·5; respiration, 24.

„ 4th „ 102°·5; „ 34.

Edward F——, aged twenty-one years (already reported as typical case.)

On the 4th day, temperature, 103°·5; respiration, 46.

„ 5th „ 102 „ 48.

„ 6th „ 103 „ 40.

„ 7th „ 103 „ 48.

„ 8th „ 97 „ 48.

John T——, aged forty years, also previously quoted.

On the 5th day, temperature, 103°·25; respiration, 42.

„ 6th „ 99°·75 „ 36.

„ 7th „ 99 „ 28.

„ 8th „ 97°·5 „ 24.

Margaret K——, aged fourteen years.

On the 10th day, temperature, 101°·5; respiration, 48.

„ 11th „ 99 „ 36.

„ 14th „ 98 „ 24.

Michael D——, aged fifty, very slight, circum—— pneumonia.

On the 8th day, temperature, 102; respiration, 36.

^b All the temperatures upon which the foregoing remarks are founded are taken in the axilla with thermometers provided for me by Mr. Yeates, of Grafton-street.

4th.—The height of the thermometer does not necessarily indicate the intensity of the disease.

5th.—The fall of temperature does not indicate the cessation of mischief, but only that the disease is about to enter on the 3rd stage.

6th.—If a high temperature is maintained for a long time (more than 3 or 4 days) or a fresh rise takes place, it indicates a fresh attack in a previously healthy part, or the advent of a complication.

7th.—The temperature and pulse usually, though not always, rise and fall together.

8th.—The temperature usually decreases before the frequency of the respirations diminish.

9th.—A high temperature before the 6th day in a doubtful case generally indicates it to be one of pneumonia and *not* of typhus.

